AMENDMENT TO THE CLAIMS

Please amend claims 1, 3, 5-10, 13-22, 25 and 27-31, and add new claims 32-37 as follows:

1. (Currently Amended) An isolated mesenchymal stromal stem cell (MSSC) that has been differentiated *in vitro* towards, or to, an intervertebral disc (IVD) cell phenotype ~~for use as a medicament~~.

2. (Original) An isolated mesenchymal stromal stem cell (MSSC) characterised in that it is:

a) differentiated *in vitro* towards, or to, a intervertebral disc (IVD) cell phenotype; and

b) genetically transformed with an exogenous gene which codes for a protein that reduces degeneration of an intervertebral disc.

3. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 1 ~~or 2~~ wherein the cell produces an extracellular matrix.

4. (Original) The isolated mesenchymal stromal stem cell according to claim 3 wherein the extracellular matrix is identifiable as an IVD extracellular matrix and is distinguishable from an extracellular matrix produced by a chondrocyte.

5. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 4 wherein the IVD matrix is characterised by at least one of:

(a) aggrecan gene expression is greater than collagen type II gene expression;

(b) the proteoglycan versican is expressed; or

(c) the GAG: hydroxproline ratio ~~(i.e proteoglycan : collagen ratio)~~ is greater than 10:1.

6. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 1, wherein the cell ~~any preceding claim that~~ is derived from blood, bone marrow, or adipose tissue.

7. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 6, wherein the cell ~~that~~ is derived from bone marrow in the sternum, femur or iliac crest.

8. (Currently Amended) The isolated mesenchymal stromal stem cell according to ~~any preceding~~ claim 1, wherein the MSSC is ~~MSSCs are~~ differentiated using at least ~~any~~ one of the steps of:

(a) growth in a IVD cell induction medium containing TGFβ, CDMP1 or CDMP2;

(b) encapsulation of the MSSC;

(c) application of Load to the MSSCs;

(d) Co-culture of the MSSC ~~MSSCs~~ with Nucleus Pulposus cells/IVD cells;

(e) Culture of the MSSC ~~MSSCs~~ in conditioned media in which IVD cells have previously been grown;

(f) Culture in low oxygen tensions; or

(g) Genetically transformed using a gene regulator of IVD cell differentiation.

9. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 8 wherein differentiation is effected by using any combination of steps (a), (b), (c), (d), (e), (f) and (g).

10. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 9 wherein the MSSC is ~~MSSCs are~~ differentiated by encapsulating the MSSC ~~MSSCs~~ in a gel; and growing the encapsulated cell ~~cells~~ in a medium for up to 5 weeks during which time a cyclical load equivalent to that experienced *in vivo* is exerted using hydraulic or other methodology.

11. (Original) The isolated mesenchymal stromal stem cell according to claim 10 wherein the media is an induction medium according to claim 8(a).

12. (Original) The isolated mesenchymal stromal stem cell according to claim 10 wherein the media is a conditioned medium according to claim 8(e).

13. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 10 wherein the MSSC is ~~MSSCs are~~ co-cultured with cells according to claim 8(d).

14. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 11, ~~any one of claims 11-13~~ wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cell is ~~cells are~~ cultured.

15. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 2, ~~any one of claims 2-14~~ wherein the exogenous gene is ~~may be~~ selected from the group consisting of genes encoding proteins involved in the regulation of inflammation, ~~and the group comprises~~ genes encoding cytokines~~;~~, genes encoding inhibitors of cytokines~~;~~, and genes encoding inhibitors of degradative enzymes.

16. (Currently Amended) The isolated mesenchymal stromal stem cell according to claim 2, ~~any one of claims 2-15~~ wherein the exogenous gene encodes Interleukin 1 Receptor Antagonist (IL-1RA).

17. (Currently Amended) A composition ~~use of a cell according to any one of claims 1-16 in the manufacture of a medicament~~ for the treatment of spinal conditions characterized by degeneration of the intervertebral disc, comprising the mesenchymal stromal stem cell of claim 1.

18. (Currently Amended) The composition ~~use~~ according to claim 17 wherein the spinal condition is Low Back Pain, degeneration of the intervertebral disc, age-related changes of the intervertebral disc or spondylolysis.

19. (Currently Amended) The composition ~~use of a cell~~ according to ~~claims~~ claim 17 ~~or 18~~ wherein the composition is configured ~~cells are~~ for direct injection into an IVD exhibiting DIVD.

20. (Currently Amended) The composition ~~use of a cell~~ according to ~~claims~~ claim 17 ~~or 18~~ wherein the composition is configured ~~cells are~~ for seeding onto or into biomaterial scaffolds or gels.

21. (Currently Amended) A method of treating spinal conditions characterized by degeneration of the intervertebral disc comprising:

providing a composition comprising ~~administering to a diseased intervertebral disc of a subject in need of such treatment~~ an isolated MSSC that has been differentiated *in vitro* towards, or to, an IVD cell phenotype; and

administering said composition to a diseased intervertebral disc of a subject in need of such treatment.

22. (Currently Amended) A method of treating spinal conditions characterized by degeneration of the intervertebral disc comprising:

providing a composition comprising ~~administering to a diseased intervertebral disc of a subject in need of such treatment~~ an isolated MSSC, wherein said MSSC has been ~~has been~~:

(a) differentiated *in vitro* towards, or to, a IVD cell phenotype~~,~~; and

(b) genetically transformed with an exogenous gene which codes for a protein that reduces degeneration of an intervertebral disc; and

administering said composition to a diseased intervertebral disc of a subject in need of such treatment.

23. (Original) A method for causing mesenchymal stromal stem cells to differentiate towards IVD cells comprising exposing cultured mesenchymal stromal stem cells to increasing pressures of up to 30 psi (2.1MPa).

24. (Original) A method for causing mesenchymal stromal stem cells to differentiate towards IVD cells comprising co-culturing NP cells and mesenchymal stromal stem cells (MSSCs) together.

25. (Currently Amended) A method for causing mesenchymal stromal stem cells to differentiate towards IVD cells comprising culturing mesenchymal stromal stem cells in media that has previously been exposed ~~exoposed~~ to NP cells.

26. (Original) A method for causing mesenchymal stromal stem cells to differentiate towards IVD cells comprising culturing mesenchymal stromal stem cells in an atmosphere in which oxygen pressure is reduced to less than 5%.

27. (Currently Amended) A method for causing mesenchymal stromal stem cells (MSSCs) to differentiate towards IVD cells comprising encapsulating MSSCs in a gel and growing the encapsulated cells in a medium for up to 5 weeks during which time a cyclical load equivalent to that experienced *in vivo* is exerted using hydraulic or other methodology

28. (Currently Amended) The method according to claim 27 wherein the media is an induction medium containing TGFβ, CDMP1 or CDMP2 ~~as defined in claim 8(a)~~.

29. (Currently Amended) The method according to claim 27 wherein the media is a conditioned medium in which IVD cells have previously been grown ~~as defined in claim 8(e)~~.

30. (Currently Amended) The method according to claim 27 wherein the MSSCs are co-cultured with Nucleus Pulposus cells/IVD cells ~~according to claim 8(d)~~.

31. (Currently Amended) The method according to claim 27 ~~any one of claims 27-30~~ wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cells are cultured.

32. (New) The method according to claim 28 wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cells are cultured.

33. (New) The method according to claim 29 wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cells are cultured.

34. (New) The method according to claim 30 wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cells are cultured.

35. (New) The isolated mesenchymal stromal stem cell according to claim 2 wherein the cell produces an extracellular matrix.

36. (New) The isolated mesenchymal stromal stem cell according to claim 12, wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cell is cultured.

37. (New) The isolated mesenchymal stromal stem cell according to claim 13, wherein the oxygen pressure is reduced to less than 5% of the atmosphere in which the cell is cultured.